Remarks

The various parts of the Office Action (and other matters, if any) are discussed below under appropriate headings.

Election/Restriction

The Examiner has issued a restriction requirement as set forth below.

Group I: Claims 1-12 and 22-37 drawn fo a method of modeling the effect of a molecular contaminant film on performance of an optical system, classified in class 703, sub class 2; and

Group II: Claims 13-21 drawn to a method of obtaining a per unit absorbance spectrum of a contamination film when the thickness of the film is unknown, classified in class 438, subclass 14.

In a telephone conference, applicant elected Group I, claims 1-12 and 22-37. Applicant hereby affirms the election of Group I, claims 1-12 and 22-37.

Claim Rejections - 35 USC § 112

Claim 8 stands rejected under 35 USC §112, second paragraph as being indefinite. In particular, the Examiner contends that the phrase "about 1 micron" is indefinite. Applicant respectfully disagrees with the Examiner for at least the following reasons.

It is respectfully submitted that claim 8 as written complies with the requirements of 35 U.S.C. § 112. One of ordinary skill in the art would recognize that real world factors may cause or make it difficult to obtain an absorbance spectrum of a material that is exactly 1 micron. Instead, the thickness of the material may be slightly more or slightly less than 1 micron. The use of the word "about" does not render the claim indefinite to one of ordinary skill in the art.

Moreover, 2173.05(b)(A) specifically discusses the term "about"

The term "about" used to define the area of the lower end of a mold as between 25 to about 45% of the mold entrance was held to be clear, but flexible. *Ex parte Eastwood,* 163 USPQ 316 (Bd. App. 1968). Similarly, in *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), the court held that a limitation defining the stretch rate of a plastic as "exceeding about

10% per second" is definite because infringement could clearly be assessed through the use of a stopwatch. MPEP §2173.05(b)(A)

Further, the Federal Circuit has consistently instructed that somewhat imprecise language does not render the claims invalid. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 6 USPQ2d 1277, 1282 (Fed. Cir. 1988) ("imprecise claim limitation, such as the phrase 'about 100% per second'" does not impart invalidity to the claims, but is to be considered in determination of infringement); *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1385, 231 USPQ 81, 95 (Fed. Cir. 1986) ("the claims, read in light of the specification, reasonably apprise those skilled in the art and are as precise as the subject matter permits. As a matter of law, no court can demand more"), cert. denied , 107 S.Ct. 1606 (1987); *Shatterproof Glass Corp. v. Libbey-Owens Ford Co.*, 225 USPQ 634, 641 (Fed. Cir.), cert. dismissed, 474 U.S. 976 (1985).

The Federal Circuit has also recognized that the Manual of Patent Examining Procedure mandates that examiners require only ***a reasonable degree of distinctness***:

The Manual of Patent Examining Procedure instructs examiners in a similar vein. See MPEP §706.03(d):

> should allow claims which define the patentable novelty with a *reasonable* degree of particularity and distinctness. Some latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as the examiner might desire." (emphasis in original)

Andrew Corp. v. Gabriel Electronics Inc., 6 USPQ2d 2010, 2013 (Fed. Cir. 1988).

It is respectfully submitted that claim 8 of the present application is sufficiently precise to meet the requirements of 35 U.S.C. § 112. The Examiner's rejection should be withdrawn.

Accordingly, withdrawal of the rejection of claim 8 is respectfully requested.

Claim Rejections - 35 USC § 102

Claims 1-12 and 22-37 stand rejected under 35 USC §102(e) as being anticipated by U.S. Patent Publication No. 2003/0068834 to *Kishkovich et al.* (hereinafter *Kishkovich*). Withdrawal of the rejection is respectfully requested for at least the following reasons.

Claims 1 and 22 recite a method and system for modeling the effect of an aggregate molecular contaminant film on the performance of an optical system. Claims 1 and 22 have been amended herein for reasons not related to patentability. The specific features of claims 1 and 22 are not recited here for sake of brevity.

The invention of claims 1 and 22 can predict the effects certain materials used in the construction an optical system will have over the life of the optical system. For example, an optical device, such as an optical sensor, is constructed of various components each formed from various materials (e.g., plastic, rubber, adhesives, etc.). The different materials each outgas soils that may accumulate on the optics of the optical system, thereby slowly degrading the performance of the optical system. The invention of claims 1 and 22 can be used to model or simulate the deposition of the outgassed materials to provide a worst-case scenario of the ultimate degradation of the optical system. This is useful in the design phase of the optical system, as it allows the designer to determine which materials are likely to provide the best results, i.e., the least amount of soil deposition on the optics over time. This allows the designer to view the effects that different materials, e.g., O-rings formed from different types of rubber, can have on the life of the optical system. By simulating the expected effect on performance of each type of material, the designer can select materials that minimize soil deposition on the optics of the optical system.

Kishkovich relates to a system and method for determining and controlling contamination in gas samples in a clean room manufacturing environment. In particular, *Kishkovich* is concerned with preventing contamination before it occurs (see, e.g., paragraph [0036] and [0037]). While *Kishkovich* does discuss contamination on optical surfaces, *Kishkovich* does not teach or suggest how one would model the effect of such contaminants on optical surfaces.

For example, Fig. 3 of *Kishkovich* simply is a spectral analysis that illustrates the elution time for high molecular weight compounds is greater than the elution time for low molecular weight compounds. Further, Fig. 4 simply shows that coverage increases as the contamination level increases. Specifically, for a given concentration, the higher molecular weight compounds collect on surfaces more readily than do lower molecular weight compounds. Neither of these graphs, however, indicate how one would model the effect of a molecular contamination film on the performance of an optical system.

Regarding the specific rejections, the Examiner cites to paragraph [0001] of *Kishkovich* as teaching "correlating a mass of material outgassed from materials of the

optical system to a spectrum of outgassed products", as recited in claim 1. Referring to the cited portion, however, nowhere is it mentioned that material is outgasssed from materials of the optical system. *Kishkovich* simply discusses sampling air and purge gasses, such as filtered and unfiltered air. These air and purge gasses are not outgassed from materials of the optical system, but instead are simply the ambient air (filtered or unfiltered) drawn into the processing environment of a photolithography system.

With respect to "predicting an aggregate molecular contaminant film thickness from each material" the Examiner cites to paragraph [0002] and specifically to the portion that states "The detection and quantification of compounds having a higher molecular weight..." as teaching the instant feature. It is respectfully noted that a discussion of molecular weight does not teach predicting a film thickness, let alone an aggregate molecular contaminant film thickness from the outgassed material, as recited in claim 1.

The Examiner also cites to Equation 2 as teaching "deriving an absorbance spectrum of the aggregate molecular contaminant film". Equation 2 relates to the effect of a molecular contaminant film on transmission and, in discussing Equation 2, *Kishkovich* expressly states that the variable αc is the absorbance of a contaminating film. Nowhere, however, does *Kishkovich* discuss deriving an absorbance spectrum of the aggregate molecular contaminant film, as recited in claim 1.

Further, the Examiner points to Fig. 2 as teaching "convolving the absorbance spectrum of the aggregate molecular contaminant film with an instrument function of the optical system". Initially, it is noted that the term convolving is well known by those having ordinary skill in the art and refers to forming convolutions. A convolution also is well known by those having ordinary skill in the art and refers to an integral that expresses the amount of overlap of one function g as it is shifted over another function f. Further, convolving the absorbance spectrum of the aggregate molecular contaminant film with an instrument function of the optical system is discussed, for example, on page 33, lines 13-17 of the application. More specifically, the cited portion states the following:

> The effect of all accumulated soils is a function of the amount of each type of soil present and is computed by convolving (i.e., integrating the absorption loss at each wavelength) the incident intensity with the instrument calibration and absorbance spectrum over the spectral band pass.

Referring to Fig. 2 of *Kishkovich*, there is shown a graph of a "mass of a sample" versus "sampling time". Nowhere does Fig. 2 teach or suggest convolving the absorbance spectrum, as recited in claim 1.

Accordingly, *Kishkovich* does not teach all of the features of claim 1. Similar comments apply to claim 22.

Claims 2-12 and 23-37 depend from claim 1 or claim 22 and, therefore, can be distinguished from *Kishkovich* for at least the same reasons.

Accordingly, withdrawal of the rejection of claims 1-12 and 22-37 is respectfully requested.

New Claims 38-45

New claims 38-45 are submitted for favorable examination. Support for the new claims can be found, for example, in the original claims, and on page 8, lines 2-24 of the specification.

New claims 38-41 depend from claim 1 or claim 22 and, therefore, can be distinguished from *Kishkovich* for at least the same reasons. Further, it is noted that new claims 38-39 and 40-41 recite features presented (and now removed) from original claims 1 and 22, respectively. Since the Examiner, in rejecting claims 1 and 22, discussed these features in the present Office Action, they will be briefly discussed here. Claims 42-45 have not yet been examined and, therefore, no comments are provided for these claims.

New claims 38 and 40 recite that the spectrum of outgassed products is normalized. In the present Office Action, the Examiner cites to paragraph [0041] as teaching "normalizing the spectrum of outgassed products". Specifically, the Examiner points to the portion of paragraph [0041] that states "The breakthrough volume is the amount of gas sample volume required to go beyond the absorbent capacity". It is respectfully submitted that this portion of paragraph [0041] has nothing to do with normalization, let alone normalizing the spectrum of outgassed products, as recited in claims 38 and 40.

New claims 39 and 41 recite plotting at least one transmission band as a function of source temperature. The Examiner cites to paragraph [0039] as teaching this feature. Paragraph [0039] discusses the requirement of increasing temperature to

regenerate beds, and the effect of temperature variations on the optics of a photolithography system. Paragraph [0039], however, does not teach or suggest plotting at least one transmission band as a function of source temperature, as recited in claims 39 and 41.

Accordingly, claims 39-41 are distinguishable from *Kishkovich*.

Conclusion

In view of the foregoing, request is made for timely issuance of a notice of allowance.

Respectfully submitted,

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